

Ranomafana National Park

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Location

Ranomafana National Park (RNP) became the fourth national park in Madagascar on 31 May 1991. Impetus for the establishment of the park was the 1986 discovery of a new species of lemur: the golden bamboo lemur (*Hapalemur aureus*) by Dr. Patricia C. Wright and colleagues. The park boundaries were carefully delineated so that no villages are within the park.

Ranomafana National Park is located in southeast Madagascar between 47°18' – 47°37' E and 21°02' – 21°25' S, approximately 90 kilometers west of the Indian Ocean, 60 km northeast of the provincial capital Fianarantsoa, and 400 km southeast of the capital city Antananarivo. The park covers 43,500 ha, (166 square miles or 106,253 acres). The park receives on average 3000 mm of rain a year with most of the rain falling from December to March.

Description of habitat

The climate of Ranomafana National Park is subtropical with rainfall averaging 2,300 – 4,000 mm annually. Monthly rainfall is highest in the warm season, December to March (400 mm), and lowest in the cool season from May to October (90 mm). Temperatures average 18 – 20°C, with lowest and highest recorded temperatures in the area being 4°C and 37°C, respectively. Most of the park area is mountainous (altitudinal gradient 400 – 1374 m) with steep terrain and contains lowland moist forest, cloud forest, and high plateau forest. One third of the park has been selectively logged; the remaining 2/3 is undisturbed. The forest is the primary watershed for southeastern Madagascar, and 29 rivers originate in the park.

Protected status

Prior to 1991 Ranomafana was a classified forest managed by the Madagascar Department of Water and Forests. In May, 1991 Ranomafana was declared a National Park managed by Duke University and then ICTE/Stony Brook University. In 1997 management was turned over to the Madagascar National Park Service, the parastatal ANGAP (Association pour la Gestion des Aires Protégées). No collecting or hunting of plants or wildlife is allowed in the park. Researchers must apply to a consortium of University of Antananarivo, Parc Tsimbazaza Zoo, ANGAP and Department of Water and Forest (CAFF/CORR committee) for research permits, and tourists pay entrance fees and must be accompanied by a tour guide. Half of the funds collected for entrance fees are returned to the villagers for conservation projects. Thirty park rangers and park staff patrol and manage the park.

Species found at the location

Ranomafana National Park has a high diversity of primates, a total of 13 species. The RNP lemurs range from 32 gram to 6 kilogram, with five day-active, six night-active, and two which are active six hours during the day and six hours during the night. Biodiversity is extremely high: 13 lemurs, 118 birds, >70 amphibians and reptiles. Endangered species include golden bamboo lemur (*Hapalemur aureus*), greater bamboo lemur (*Prolemur simus*), black and white ruffed lemur (*Varecia variegata*), aquatic tenrec (*Limnogale mergulus*), Madagascar serpent eagle (*Eutriorchis astur*), and the slender-billed flufftail (*Sarothrura watersi*). RNP contains most species found in the threatened eastern forest corridor of Madagascar.

Conservation and research activities at the location

Dr. Wright was the driving force behind the development of a research station in Ranomafana National Park in 1986 and of the modern research and training Centre ValBio in 2003. Centre ValBio's mission is to promote and research biodiversity and conservation of Madagascar's

rainforests, and to train a new generation of conservation biologists. The research station provides meals, laboratory, and classroom space for researchers and students. Over 150 international and Malagasy scientists come to the site to study rainforest biology each year. The publication list of research conducted at RNP exceeds 325 articles (see www.sunysb.edu/madagascar). Ecological research contributes to the management decisions for the park.

Research built a strong conservation foundation at Ranomafana by beginning early to assist the local people in understanding the value of their biodiversity. The project built seven schools, and rebuilt seven more in the first five years. Following this came development of conservation materials in Malagasy for the school teachers to incorporate into the curriculum. Recent programs initiated are Young Naturalists groups for adolescents, reforestation project in the schools, local language pamphlets on biodiversity. Health is also a concern of these remote villages, and the a health team headed by a medical doctor brings basic health and hygiene to 25 villages, linking the conservation of this watershed with improvements in health. By providing over 150 jobs for local residents directly linked to the park (park rangers, research assistants, tourist guides), as well as the increasing number of jobs for the burgeoning tourist industry in shops, hotels and restaurants, the Malagasies see a direct economic value to preserving wildlife. Small businesses like production of top quality honey, reforesting and selling endemic trees, producing and weaving native silk products, harvesting medicinal plant gardens make small but effective ways that local people can value their biodiversity.

Box 5. Greater bamboo lemur helps protect itself from extinction

In 1986, *Hapalemur simus* was feared to be extinct. Though it is the most abundant subfossil lemur in parts of Madagascar, it had only been seen alive in two localities in the previous 100 years. So the discovery by Dr. Patricia Wright and colleagues of a group of 11 *Hapalemur simus* in the Ranomafana forests and group of six in a coffee plantation to the east was cause for excitement. After the establishment of Ranomafana National Park in 1991, Dr. Wright and her student Chia Tan initiated long-term studies of the *H. simus*. From 1986 - 2006, 54 exploratory searches for lemurs were mounted, and these located only eight groups of *H. simus*. In 2003, taxonomists separated *H. simus* into a separate genus (*Prolemur simus*). By this date, only eight groups of *Prolemur simus* were known, and the only habituated group was in Ranomafana National Park.

In December 2004, a Centre ValBio lemur technician reported that the adult males of the Ranomafana group had disappeared! Maybe they were eaten by a fossa? The breeding season is April-May and the birth season is in November. No males were seen in that group all during 2005. No infants were born into the group in November of that year.

In April 2005, the IUCN Global Mammal Assessment Committee declared that *Prolemur simus* was the most endangered lemur in Madagascar, and one of the top five endangered primates in the world. As the 2006 breeding season was approaching, discussions included whether males should be translocated to Ranomafana from another group in the wild or from captivity.

But then the lemurs took action! On April 12, the entire Ranomafana *Prolemur simus* group, with the females leading, began to move. They travelled out of their territory, north out of RNP across the tourist foot bridge, across the main highway in southeastern Madagascar, back into the northern parcel of Ranomafana National Park, and out again into the peripheral zone near the village, Ambatolahy Dimy. There they met the only other known *Prolemur simus* group in the Ranomafana region, which also had no males. After a month of travel over 10 km, the group returned to their original territory, maleless. Then in June, a young male joined the group, we don't know from where. We are hoping for infants in November! The immediate conservation need is to find a breeding male for the peripheral zone group and keep it protected.

At an international level, research carried out at Centre ValBio provides the scientific knowledge that has formed the basis of numerous print and broadcast media (BBC, National Geographic, Smithsonian Magazine, National Public Radio) and documentaries that have increased international appreciation for the biodiversity value of the area.

Conservation targeted at endangered species

Prolemur simus (greater bamboo lemur) is one of the most critically endangered primates in the world. The Centre ValBio is currently working with local villagers to establish a community based conservation programme in an area where a group of *P. simus* resides near a village. The project includes monitoring of the *P. simus* population by trained villagers, cultivation and reforestation of the bamboo species favored by *P. simus* and also used for housing construction by the villagers, and education.

Reforestation: Centre ValBio scientists are working closely with villagers to develop and implement methods of reforesting deforested areas outside the park using native species. Currently we have several tree nurseries where native species are grown to the sapling stage. Villages have donated land where the saplings are planted, and participate in the planting. Several tree species are doing well, and the villagers are seeing regrowth of deforested areas near their villages. Local schools are involved in this project, raising the tree seedlings and planting the saplings near their schools.

Box 6. Lemur kindergartens: *Varecia variegata*

Varecia variegata (the black-and-white ruffed lemur) is a critically endangered primate that can be found only in the eastern rainforests of Madagascar. Ruffed lemurs have lavish black-and-white coats and a white ruff surrounding their faces and ears. Their fluffy appearance and playful personality makes this species one of the most entertaining to observe in the wild. Interestingly, it is the only diurnal lemur that gives birth to litters, often between two to five young. Unlike most primate offspring, *Varecia* infants lack clinging abilities during their first few months after birth so the mothers are faced with a unique challenge: how to get enough food while supervising a litter of vulnerable and relatively uncoordinated infants. Their solution is to 'park' their babies in nests, called 'kindergartens,' constructed from lianas and branches high in the trees. Multiple mothers have been seen using the same nest at once, hiding all of their offspring together in a single location. A lone adult is then left to babysitting all of the infants until their mothers' return. Little information is known about this intriguing behaviour. Who is responsible for babysitting? Siblings? Aunts? Males interested in befriending mothers? The father? And what are their responsibilities while participating in this unique behaviour? Stony Brook University graduate student, Andrea Baden's research in Ranomafana National Park will be the first to observe *V. variegata* nesting behaviours in the wild to answer these very questions. Baden and colleagues are also participating in both genetic and biomedical surveys to assess the health of the black-and-white ruffed lemurs in Ranomafana National Park. These surveys will be used to help improve conservation management plans for this species in the wild, as well as to better understand how to care for these animals in captivity.

Local communities and customs

The people around Ranomafana National Park are from both the Betsileo and Tanala ethnic

groups. The Betsileo are traditionally paddy rice farmers from the high plateau area of Fianaranatsoa. The Tanala (people of the forest) depend on slash and burn agriculture. Cultural traditions emphasize a strong respect for ancestors and elders. Communities Villages (150-200 residents) are organised around descendent groups headed by an "mpanjaka" (king or queen) and traditional knowledge of medicines and the spirit world is guarded by the "ombiasa" (medicine man or woman). Villagers have limited access to medical care, and most rely on traditional herbal remedies. Running water and electricity are available in the town of Ranomafana (7 km from the park entrance), but most villages do not have access to either. Village children generally receive only 3-6 years of education, with children in Ranomafana having access to more schooling (through high school) than children in remote villages.

The park is surrounded by a semi-managed 3 km wide buffer zone. Approximately 27,000 people live in the buffer zone. Fifty percent of all tourism revenue within the park is redistributed to villages in the Buffer Zone.

The dominant source of deforestation in southeast Madagascar is agriculture. Indeed in the Ranomafana area, more than 85% of the people in the buffer zone rely on subsistence agriculture as their principal economic activity. Rice is the staple crop, with minor crops including bananas, cassava, coffee, corn, beans, pineapple, sugar cane, and tobacco. Farmers chose between two methods of rice production: slash-and-burn upland rice (tavy) and wetland paddy rice. The principal anthropogenic threats to the forests surrounding RNP arise from the clearing of hillsides for the slash and burn tavy. Additional threats, come from the conversion of wetlands to paddy fields, and the harvesting of non-timber forest products (NTFP) in buffer zone forests, including firewood, crayfish collection, fruits, palms, roots and other products for subsistence use.

How to visit the site

People interested in visiting Ranomafana National Park can fly Air France, Air Madagascar or Air Mauritius into Ivato International Airport near the capital city of Madagascar, Antananarivo. From Antananarivo to the park is either an 8 hour scenic drive south on a main paved road or a one hour flight to the regional capital, Fianaranatsoa. Flights from Antananarivo to Fianarantsoa only occur once or twice a week. From Fianarantsoa to RNP is a 1.5 hour drive. Arrangements for travel to RNP can be made by contacting MICET (Madagascar Institut pour la Conservation des Ecosystems Tropicaux, MICET@wanadoo.mg).

Excellent clean and well managed hotels with good restaurants include Centrest Hotel, Setam Lodge and Domaine Nature. Tent sites are available at the entrance to the park. The best months to visit are April, May and June, as well as the spring September- December when wildlife is breeding and raising offspring.